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EXAMINER

LUGO, DAVID B

ART UNIT

PAPER NUMBER

2637

DATE MAILED: 02/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/846,061

Applicant(s)

DEMJANENKO ET AL.

Examiner

David B. Lugo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) 8 and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/15/01</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of claims 1-7 in the reply filed on 9/30/04 is acknowledged. It is noted that there are three independent claims: claims 1, 6, and 8, not two as stated by applicant. Claim 1 is drawn to a method of producing a modulated signal with FEC in a QAM transmitter, and claim 6 is drawn to a method of producing a recovered information bit stream from a modulated signal with FEC in a QAM receiver, and claims 1-7 define Invention I. Claim 8 is drawn to a method in a QAM receiver for adapting to performance conditions, and claims 8 and 9 define Invention II. The traversal is on the ground(s) that Inventions I and II are related to a transmitter and a corresponding receiver, and therefore cannot be separately useable. This is not found persuasive because the transmitter and corresponding receiver (defined by claims 1 and 6) are already grouped together in Invention I. Invention II, defined by claim 8, relates to adapting to performance conditions where a performance metric is determined and used to select a puncturing pattern for enhancing system performance. Inventions I and II are considered to be separately useable, as FEC may be employed with a fixed puncturing pattern in Invention I instead of a variable puncturing pattern as used in Invention II.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 8 and 9 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 9/30/04.

Specification

3. The disclosure is objected to because of the following informalities:

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a. Page 2, lines 37, 40 and 41, “09/248,099”, “09/242,393” and “09/244,550” should be --60/248,099--, --60/242,393-- and --60/244,550--, respectively.

b. In order to correspond with the Figures, the following changes to the Brief Description of the Drawings should be made:

- Page 4, line 5 – Fig. 19: “N=4,096” should be --N=6,144--.
- Page 4, line 15 – Fig. 24: “N=4,096” should be --N=6,144--.
- Page 5, line 3 – Fig. 45: “N=2,048” should be --N=4,096--.
- Page 5, line 36 – Fig. 61: “N=2,046” should be --N=2,048--.
- Page 5, line 40 – Fig. 63: “N=2,050” should be --N=2,048--.
- A description of Figure 79 should be added to the Brief Description.

c. In order to correspond with the Figures, the following changes to the Detailed Description of the Invention should be made:

1. Page 32, line 14, “Figure 39” should be --Figure 40--.
2. Page 41, line 4, “Figure 52” should be --Figure 53--.
3. Page 41, line 10, “as shown in Figure 53” should be deleted.
4. Page 47, line 3, “Figure 57 should be --Figure 58--.
5. Page 47, line 8, “Figures 58-64” should be --Figures 59-65--.
6. Page 52, line 20, “Figure 57 should be --Figure 58--.
7. Page 52, line 25, “Figures 65-71” should be --Figures 66-72--.
8. Page 54, line 17, “In Figure Receiving” should be corrected to include reference to Figure 73.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Gelblum et al.

U.S. Patent 6,088,387.

11. Regarding claim 1, Gelblum et al. disclose a method of producing a modulated signal with forward error correction from an information bit stream in a QAM transmitter in Fig. 1 comprising producing first and second parity bit streams (17, 18) using first and second concatenated coders (12, 14) interconnected by an interleaver 16, selecting respective subsets of the first and second parity bit streams in accordance with a puncturing pattern (21), combining the subsets of the first and second parity bit streams with the information bit streams in uniform interleaver 22, and producing a QAM symbol by mapping subsets of the combined bit streams to the I and Q dimension using a mapping scheme such as Gray mapping (col. 5, lines 37-40, Fig. 2), modulating the QAM symbol stream using a QAM modulator 26, and transmitting the signal over a communication channel (see col. 3, line 51 to col. 4, line 35).

12. Regarding claim 2, Gelblum et al. further disclose that parity bits are removed in puncturing to reduce overhead (col. 2, lines 35-39), and optimal code rates of more than $\frac{1}{2}$ and higher are typically used (col. 6, lines 15-16), which would result in the number of parity bits being less than the number of information bits for each symbol.

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13. Regarding claims 3-5, Gelblum et al. further state that parity bits are split between the most significant bits of the I-channel and the Q-channel (col. 10, lines 17-21), where information bits are assigned to remaining bits including the least significant bit (see col. 10, lines 9-21).

14. Regarding claim 6, Gelblum et al. disclose a method of producing a recovered information bit stream from a noisy modulated signal with forward error correction in a QAM receiver in Fig. 3 comprising receiving a modulated signal representing a QAM symbol stream which includes errors from a communications link, demodulating (30) the received signal, and producing a decoded bit stream by iteratively decoding the demodulated signal where the I and Q dimensions are separately provided and decoded using a puncturing pattern, and regenerating the information bit stream from the decoded bit stream (col. 4, line 36 to col. 5, line 5).

15. Regarding claim 7, Gelblum et al. further disclose that parity bits are removed in puncturing to reduce overhead (col. 2, lines 35-39), and optimal code rates of more than $\frac{1}{2}$ and higher are typically used (col. 6, lines 15-16), which would result in the number of parity bits being less than the number of information bits for each symbol.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Ramaswamy et al. U.S. Patent 5,740,203 disclose an FEC coding system using Gray code mapping.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David B. Lugo whose telephone number is 571-272-3043. The examiner can normally be reached on M-F; 9:30-6.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David B. Lugo
2/11/05


KHAI TRAN
PRIMARY EXAMINER 2/15/05